EXECUTIVE SUMMARY

SITHAMPOONDI MULTI COLOUR GRANITE CLUSTER QUARRIES

At

Sithampoondi Village, Paramathivelur Taluk, Namakkal District,

Tamil Nadu

NAME OF PROPOSED PROJECT PROPONENTS APPLYING IN CLUSTER

Code	Name of the Proponent	S.F.No	Extent (Ha)
P1	Thiru S.K.P. Murugaen	348 (P) & 349/2 (P)	**1.50.5 ha**
P2	M/s. Kalpa Exports	504, 505/1, 505/2 & 856/2A	**4.35.0 ha**
P3	Tvl.P.K.K. Exports	488/1B(P) and 503/3(P)	**2.42.9ha**

"B1" CATEGORY/ MINOR MINERAL /CLUSTER/ NON-FOREST LAND/ PATTA LAND

*** CLUSTER EXTENT = 30.71.27 Ha**

* Cluster Calculated as per MoEF & CC Notification – S.O. 2269(E) Dated: 01.07.2016

ToR Obtained vide

Lr No. SEIAA-TN/F.No.10260/SEAC/ToR-1554/2023 Dated :27.09.2023-P1
Lr No.SEIAA-TN/F.No.10496/2023/SEAC/ToR- 1670/2024 Dated: 08.02.2024-P2
Lr No.SEIAA-TN/F.No.10724/2024/SEIAA/ToR- TO23B0108TN5883450N Dated: 12.06.2024-P3

Environmental Consultant

GEO EXPLORATION AND MINING SOLUTIONS

Old No. 260-B, New No. 17,
Advaitha Ashram Road, Alagapuram,
Salem – 636 004, Tamil Nadu, India

Accredited for sector 1 Category 'A' & 38 Category 'B'
Certificate No : NABET/EIA/2225/RA 0276

Phone: 0427-2431989,
Email: ifthiahmed@gmail.com, geothangam@gmail.com
Web: www.gemssalem.com

Baseline Monitoring Period – October 2023 - December 2023

ENVIRONMENTAL LAB

GLOBAL LAB AND CONSULTANCY SERVICES

Approved by ISO:9001:2015, NABL, FSSAI, Experts in QHSE

S.F No:92/3A2, Geetha Nagar, Alagapuram Pudur, Salem-636016.

APRIL 2024

1. INTRODUCTION

This EIA report is prepared by considering Cumulative load of all proposed & existing quarries around Sithampoondi Multicolour Granite Quarry (Total Cluster 30.71.27 Ha) lease at Sithampoondi Village, Paramathivelur Taluk, Namakkal District, Tamil Nadu State, Cluster area calculated as per MoEF & CC Notification S.O. 2269(E) Dated 1st July 2016.

The proponent has obtained necessary statutory clearances from the Department of Geology and Mining, Salem District, Tamil Nadu (Statutory Clearance Documents are enclosed along with Mining plan as Annexure No III). The total Extent of the quarries within the radius of 500m from this proposal is > 5Ha, hence the proposal falls under "B1" Category project as per the EIA notification, 2006 (As amended timely).

Proponent applied for Environmental clearance to SEIAA, Tamil Nadu and obtained

CODE	Name of the proponent	Extent (Ha)	Terms of Reference (ToR)
P1	Thiru.S.K.P. Murgean	**1.50.5**	Lr No. SEIAA-TN/F.No.10260/SEAC/ToR-1554/2023 Dated :27.09.2023.
P2	M/s.Kalpa Exports	**4.35.0**	Lr No.SEIAA-TN/F.No.10496/2023/SEAC/ToR- 1670/2024 Dated: 08.02.2024.
P3	Tvl.P.K.K. Exports	**2.42.9**	Lr.No.SEIAA-TN/F.No.10724/2024/SEIAA/ToR-TO23B0108TN5883450N Dated: 12.06.2024

for carrying out EIA and EMP studies for the Multi Colour Granite Quarry.

To carry out the EIA studies and to prepare EIA and EMP studies the proposed & existing quarries of Sithampoondi Multi colour Granite Cluster Quarries have engaged a consultant M/s. Geo Exploration and Mining Solutions, Salem, Tamil Nadu. The Baseline Monitoring study has been carried out during post monsoon season (Oct - Dec 2023) considering the provisions of MoEF & CC Office Memorandum Dated: 29.08.2017 and MoEF & CC Notification S.O. 996 (E) Dated: 10.04.2015.

"Draft EIA report prepared on the basis of ToR Issued for carrying out public hearing for the grant of Environmental Clearance from SEIAA, Tamil Nadu"

1.1 DETAILS OF PROJECT PROPONENT

P1	
Name of the Project proponent	Thiru. S.K.P. Murugaen
Address	S/o. Kandasamy, F/2, Jain Akshaya Nagar, No.15, Thirumurthy Street, T.Nagar, Chennai, Tamil Nadu – 600 017
Mobile	+91 94433 55929 & 98427 92708
Email	kandha3333@gmail.com
Status	Proprietor

P2	
Name of the Project proponent	M/s.Kalpa Exports (**Thiru. G.P. Panneer – Managing Partner)**
Address	No.3/196, Sithampoondi Village, Paramathi Velur Taluk, Namakkal District,

	Tamil Nadu - 637 203
Mobile	+91 94421 31403
Email	kalpaexports@gmail.com
Status	Partnership firm
P3	
Name of the Project proponent	Tvl.P.K.K. Exports (**Thiru. G.P. Panneer – Managing Partner)**
Address	No31, Elango Adigal Street, K.K.Nagar, Madurai District, Tamil Nadu – 625 020
Mobile	+91 94421 31401
Email	pkkexports2006@gmail.com
Status	Partnership firm

The project proponent is an individual.

1.2 QUARRY DETAILS WITHIN 500 M RADIUS

PROPOSED QUARRIES				
CODE	**Name of the Proponent and Address**	**S.F. Nos, Village & Taluk**	**Extent in Ha**	**ToR Status**
P-1	Thiru. S. K. P. Murugaen	348 (P) & 349/2 (P) Sithampoondi Village, Paramathivelur Taluk,	1.50.5Ha	**Lr. No. SEIAA-TN/F.No.10260/SEAC/ToR-1554/2023 Dated:27.09.2023**
P-2	M/s. Kalpa Exports	504, 505/1, 505/2 & 856/2A Sithampoondi Village, Paramathivelur Taluk,	4.35.0Ha	**Lr No. SEIAA-TN/F.No.10496/2023/SEAC/ToR-1670/2024 Dated: 08.02.2024**
P-3	Tvl.P.K.K. Exports	488/1B(P) and 503/3(P), Sithampoondi Village, Paramathivelur Taluk	2.42.9Ha	**Lr.No.SEIAA-TN/F.No.10724/2024/SEIAA/ToR-TO23B0108TN5883450N Dated: 12.06.2024**
P-4	Thiru. S. K. P. Murugaen	346/2A(P), 246/2B (P), 346/2E (P) & 346/2G (P) Sithampoondi Village, Paramathivelur Taluk,	2.00.0 Ha	**Nearby Proposed Quarry**
	Total Extent		**10.28.4 Ha**	
EXISTING QUARRY				
CODE	**Name of the Proponent and Address**	**S.F. Nos, Village & Taluk**	**Extent in Ha**	**Lease Period**
E-1	Tvl.P.K.K. Exports	488/1B(P), 488/2(P), 489/3(P), 489/4(P), 489/5A(P), 497 & 503/3 (P) Sithampoondi Village, Paramathivelur Taluk,	4.86.0Ha	**17.04.2015 to 16.04.2035**
E-2	Thiru. P. Mayilvaganan	142/1 Sithampoondi Village, Paramathivelur Taluk,	4.94.5Ha	**05.01.2016 to 04.01.2036**
E-3	Thiru. P. Mayilvaganan	141/1A Sithampoondi Village, Paramathivelur Taluk,	3.64.37Ha	**05.01.2017 to 04.01.2037**
E-4	Thiru. M. Sengottuvel	503/1 Sithampoondi Village, Paramathivelur Taluk,	2.28.5Ha	**17.02.2016 to 16.02.2036**
E-5	M/s. Mahasen Exports	489/3B, 489/4B & 489/5A2 Sithampoondi Village, Paramathivelur Taluk,	2.20.5 Ha	**16.11.2022 to 15.11.2042**
E-6	M/s.M.P.Granite (G.O.24)	501/1 & 501/2B Sithampoondi Village,	2.49.0 Ha	**28.10.2014 to 27.10.2034**

		Paramathivelur Taluk,			
	TOTAL		20.42.87 Ha		
ABANDONED/EXPIRED QURRIES					
CODE	**Name of the Proponent and Address**	**S.F. Nos, Village & Taluk**	**Extent in Ha**		**Lease Period**
NIL					
TOTAL CLUSTER EXTENT			**30.71.27 Ha**		

TABLE 1.3 SALIENT FEATURES OF THE PROPOSAL "P1"

Name of the Quarry	**Thiru S.K.P Murugaen Multi Colour Granite Quarry**
Lease period	20 years
Mining Lease area	1.50.5 Ha
Type of Land	Proponent own patta Land
Location	S.F.No. 348(P) & 349/2 (P) of Sithampoondi Village, Paramathivelur Taluk, Namakkal District, Tamilnadu.
Mining Plan Period	5 Years
Estimated Life of the Mine	26 years
Proposed Depth for five years plan period	25m
Existing Pit Details	Pit I: 3,325 m^2 x 5m (D) Pit II: 3,497 m^2 x 10m (D)
Ultimate Depth	164m(L) x 61m (W) x 25m (D)
Toposheet No	58-E/16
Latitude between	11°14'39.62"N to 11°14'42.43"N
Longitude between	77°54'45.84"E to 77°54'52.57"E
Topography	The area is situated in almost plain terrain Altitude – 176m above from MSL. Slope - towards Southwest
Proposed manpower deployment	33
Total EMP Cost	322 Lakhs – for life of the mine
CER Cost	Rs. 5,00,000/-

TABLE 1.4 SALIENT FEATURES OF THE PROPOSAL "P2"

Name of the Quarry	**M/s.Kalpa Exports (Thiru. G.P. Panneer – Managing Partner)**
Lease period	20 years
Mining Lease area	4.35.0 Ha
Previous EC	Lr.No. DEIAA-NMK-TN/F.No.259/Mines/03/ EC.No.01/2018, Dated: 23.02.2018
CTO/ TNPCB	F.1284NML/RS/DEE/TNPCB/NML/A/2018 dated 22/03/2018
TNPCB Renewal of consent copy	F.1166KMP/RS/DEE/TNPCB/KMP/A/2023 dated 14/03/2023
Type of Land	Proponent own patta Land
Location	S.F.No. 504, 505/1, 505/2 & 856/2A of Sithampoondi Village, Paramathivelur Taluk, Namakkal District, Tamilnadu.
Scheme Period (2023-2028)	5 Years
Lease period	20 Years

Estimated Life of the Mine	46 years
Proposed Depth for five years plan period	33m
Existing Pit Details	(L)270m x 78m (W) x 8m(D)
Ultimate Depth	289m(L) x 140m (W) x 43m (D) (Agl 5m + Bgl 38m)
Toposheet No	58-E/16
Latitude between	11°14’48.84” N to 11°14’58.59” N
Longitude between	77°54’05.72” E to 77°54’15.16” E
Topography	The area is situated in almost flat terrain Altitude – 174-179m above from MSL. Slope – towards Southwest
Water table	69m
Proposed manpower deployment	40
Operational cost	3,56,48,000/-
Total EMP Cost	3,80,000/-
Total Project cost	3,60,28,000/-
CER Cost	Rs. 5,00,000/-
R.F area	Arachalur R.F-23km-SW Saruvumalai R.F-26km -SE
Wildlife sanctuary	Vellode Bird Sanctuary – 27km –West
Nearest habitation	200m-W

TABLE 1.4 SALIENT FEATURES OF THE PROPOSAL “P3”

Name of the Quarry	**Tvl.P.K.K. Exports (Thiru. G.P. Panneer–Managing Partner)**
Lease period	20 years
Mining Lease area	2.42.9 Ha
Type of Land	Proponent own patta Land
Previous EC	Lr.No. SEIAA-TN/F.No.4850/EC/1(a)/2889/2016, Dated:15.02.2016
CCR Obtained	F.No. E. P/12.1/2022-23/SEIAA/227/TN/72, Dated: 09.01.2023
Location	S.F.No. 488/1B(P) and 503/3(P), of Sithampoondi Village, Paramathivelur Taluk, Namakkal District, Tamilnadu.
Third Scheme of mining Period (2022-2027)	5 Years
Estimated Life of the Mine	21years
Proposed Depth for five years plan period	46m
Existing Pit Details	Pit I: 124m(L) x 74m (W) x 16m (D) Pit II: 99m(L) x 31m (W) x 38m (D)
Ultimate Depth	164m(L) x 61m (W) x 25m (D)
Toposheet No	58-E/16
Latitude between	11°14’43.90’’N to 11°14’50.89’’N
Longitude between	77°54’18.89’’E to 77° 54’29.24’’E
Topography	The area is situated exhibits flat plain terrain. The gradient is gentle northwest and the Altitude – 172m (Max) above from MSL
Proposed manpower deployment	40
Operation cost	Rs.3,53,98,000/-

Total EMP Cost	Rs.3,80,000/-
Total Project cost	Rs.3,57,8,000/-
CER Cost	Rs. 5,00,000/-
R.F area	Arachalur R.F-23km-SW Saruvumalai R.F-26km -SE
Wildlife sanctuary	Vellode Bird Sanctuary – 27km –N.West
Nearest habitation	500m-S

1.3 STATUTORY DETAILS

Project – P1

The proponent applied for Granite Quarry Lease, Dated: 03.03.2017.

- The precise area communication has been granted as per Govt. letter No. G.O. (3D) No.12 Industries (MMB.2) Department dated: 19.03.218 for a period of 20 years.
- The Scheme of quarrying was approved by the Commissioner of Geology and Mining, Guindy, Chennai Vide Rc. No. 3084/MM4/2020, dated: 05.05.2023.
- Proponent applied for ToR to get Environmental Clearance vide online Proposal No. SIA/TN/MIN/436999/2023 Dated: 17.07.2023.
- The proposal was placed in 407th SEAC meeting held on 07.09.2023 and the committee recommended for issue of ToR.
- The proposal was considered in 658th SEIAA meeting held on 26.09.2023 & 27.09.2023 and issued ToR vide Lr.No SEIAA-TN/F.No. 10260/SEAC/TOR-1554/2023, Dated :27.09.2023

Project – P2

The proponent applied for Granite Quarry Lease, Dated: 24.05.2017.

- The precise area communication has been granted as per Govt. letter No. G.O. (3D) No.10 Industries (MMB.2) Department dated: 05.03.2018 for a period of 20 years.
- The first Scheme of quarrying was approved by the Commissioner of Geology and Mining, Guindy, Chennai Vide Rc. No. 1110/MM4/2023, dated: 23.05.2023.(2023-2028)
- Proponent applied for ToR to get Environmental Clearance vide online Proposal No. SIA/TN/MIN/430764/2023 Dated: 25.05.2023.
- The proposal was placed in 436th SEAC meeting held on 09.12.2023 and the committee recommended for issue of ToR.
- The proposal was considered in 693th SEIAA meeting held on 08.02.2024 and issued ToR vide Lr.No.SEIAA-TN/F.No.10496/2023/SEAC/ToR- 1670/2024 Dated: 08.02.2024.

Project – P3

The proponent applied for Granite Quarry Lease, Dated: 14.07.2016.

- The precise area communication has been granted as per Govt. letter No. G.O. (3D) No.30 Industries (MMB.2) Department dated: 21.02.2007 for a period of 20 years.
- The Second Scheme of quarrying was approved by the Commissioner of Geology and Mining, Guindy, Chennai Vide Rc. No. 7078/MM4/2020, dated: 26.12.2020.
- Proponent applied for ToR to get Environmental Clearance vide online Proposal No. SIA/TN/MIN/449810/2023 Dated: 21.10.2023.
- The proposal was placed in 457th SEAC meeting held on 03.04.2024 and the committee recommended for issue of ToR.
- The proposal was considered in 726th SEIAA meeting held on 03.06.2024 and issued ToR vide Lr No.SEIAA-TN/F.No.10724/2024/SEIAA/ToR- TO23B0108TN5883450N Dated: 12.06.2024.

1.4 PROJECT DESCRIPTION

The proposed project is site specific and there is no additional area required for this project. There is no effluent generation/discharge from the proposed quarries. Multicolour granite quarry is proposed to be excavated by opencast mechanized method involving splitting of rock mass of considerable volume from the parent rock mass by jackhammer drilling and blasting, hydraulic excavators are used for loading the Rough Stone from pithead to the needy crushers and rock breakers to avoid secondary blasting.

2.1 SITE CONNECTIVITY TO THE PROJECT AREA

Nearest Roadway	NH-44-Namakkal-Salem Highway-16km-SE SH-381A - Erode – Vellakoil Road – 14km - SW MDR-86- Tiruchengode-Paramathi-Namakkal Road – 5.0km-E
Nearest Village	Sullipalayam Village – 1.2km-SE
Nearest Town	Paramathi– 15.0 km - SE
Nearest Railway Station	Pasur Railway Station – 6.0 Km - West
Nearest Airport	Coimbatore Airport – 98.0 km – South West
Seaport	Thoothukudi - 278 km South West

2.2 LAND USE PATTERN OF THE PROPOSED PROJECT

P1

Description	Present area in Ha	Area to be required during this Scheme period (ha)	Area at the end of Life of Quarry (Ha)
Area under quarry	0.68.22	Nil	1.09.0
Waste dump	0.68.33	Nil	0.39.0 Backfilling #
Infrastructure	Nil*	Nil*	Nil*
Roads	0.02.00	Nil	0.02.00
Green Belt	Nil @ 0.03.0	Nil @ 0.13.0	Nil @ 0.36.5
Stocking blocks	0.11.95	0.11.95	0.00.50
Total	**1.50.50**	**0.11.95**	**1.50.50**

Source: Approved Scheme of Mining Period

P2

Description	Present area in Ha	Area required during this Scheme period (ha)	Area at the end of this scheme period (Ha)	Area at the end of Life of Quarry (Ha)
Area under quarry	1.16.4	1.11.3	2.27.7	3.55.0
Waste and soil dump	1.10.8	Nil	1.10.8	Backfilled
Infrastructure	Nil	0.01.0	0.01.0	0.01.0
Roads	0.03.00	Nil	0.03.0	0.03.0
Green Belt	Nil @ 0.10.0	Nil @ 0.20.0	Nil @ 0.30.0	0.52.0
Stocking blocks	2.04.8	0.92.5	0.92.5	0.24.0
Total	**1.50.50**	**2.04.8**	**4.35.0**	**4.35.0**

P3

Description	Present area in Ha	Area to be required during this present Scheme period (ha)	Area at the end of Life of Quarry (Ha)
Area under quarry	1.03.5	Nil	1.72.8
Waste dump	0.67.7	Nil	Backfilled
Infrastructure	*Nil	*Nil	*Nil
Roads	0.03.00	0.01.0	0.02.0
Green Belt	Nil	0.19.8	0.19.8
Stocking blocks	0.68.7	0.47.9	0.48.3
Total	**2.42.9**	**0.68.7**	**2.42.9**

Source: Approved Scheme of Mining Period

2.3 OPERATIONAL DETAILS OF LEASE APPLIED AREA

P-1	
Description	**Details in m^3**
Geological Resources ROM	2,82,975
Granite Recovery (60 % in m^3)	1,69,785
Granite Waste (40 % in m^3)	1,13,190
Weathered rock(m^3)	24,603
Top Soil in m^3	16,402
Mineable Reserves ROM	91,875
Granite Recovery (60 % in m^3)	55,125
Granite Waste (40 % in m^3)	36,750
Weathered rock (m^3)	7,974
Top Soil in m^3	8,004
Proposed Production for five years plan period ROM	17,437
Granite Recovery (60% in m^3)	10,462
Granite Waste (40 % in m^3)	6,975
Weathered rock(m^3)	-
Top Soil in m^3	-
Number of Working Days	300
Production of ROM per day in five-year plan period	12
Production of Granite per day	7
Total Waste per day (Granite waste + Weathered Rock)	5

Source: Approved Scheme of Mining Period

P-2	
Description	**Details in m^3**
Geological Resources ROM	15,62,609
Granite Recovery (60 % in m^3)	9,37,565
Granite Waste (40 % in m^3)	6,25,044
Weathered rock(m^3)	33,472
Top Soil in m^3	60,856
Mineable Reserves ROM	6,44,474
Granite Recovery (60 % in m^3)	3,86,684

Granite Waste (40 % in m^3)	2,57,790
Weathered rock (m^3)	21,906
Top Soil in m^3	39,030
Proposed Production for five years plan period ROM	69,955
Granite Recovery (60% in m^3)	41,973
Granite Waste (40 % in m^3)	27,982
Weathered rock(m^3)	1,652
Top Soil in m^3	16,260
Number of Working Days	300
Production of ROM per day in five-year plan period	47
Production of Granite per day	28
Total Waste per day (Granite waste + Weathered Rock)	20

Source: Approved Scheme of Mining Period

P-3	
Description	**Details in m^3**
Geological Resources ROM	7,84,767
Granite Recovery (60 % in m^3)	4,70,860
Granite Waste (40 % in m^3)	3,13,907
Weathered rock(m^3)	38,195
Top Soil in m^3	6,953
Mineable Reserves ROM	2,12,492
Granite Recovery (60 % in m^3)	1,27,495
Granite Waste (40 % in m^3)	84,997
Weathered rock (m^3)	12,600
Top Soil in m^3	2,091
Proposed Production for five years plan period ROM	50,125
Granite Recovery (60% in m^3)	30,075
Granite Waste (40 % in m^3)	20,050
Weathered rock(m^3)	-
Top Soil in m^3	-
Number of Working Days	300
Production of ROM per day in five-year plan period	33
Production of Granite per day	20
Total Waste per day (Granite waste)	13

Source: Approved Scheme of Mining Period

FIGURE – 1: GOOGLE IMAGE SHOWING PROJECT AREA

SATELLITE IMAGERY OF P1

SATELLITE IMAGERY OF P2

SATELLITE IMAGERY OF P3

FIGURE – 2: GOOGLE IMAGE SHOWING CLUSTER (500 m QUARRIES)

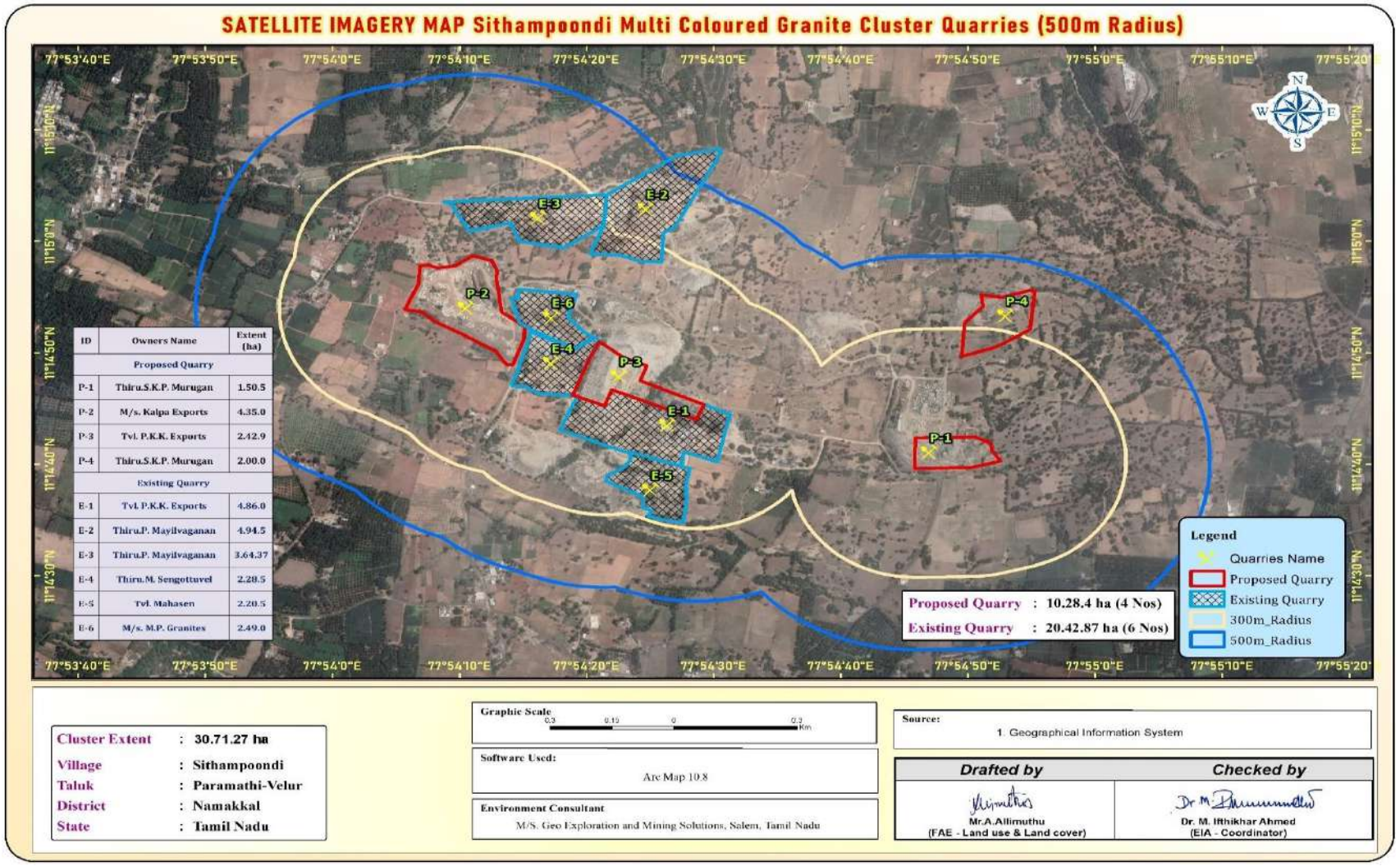


FIGURE – 3: TOPOSHEET MAP COVERING 10 KM RADIUS

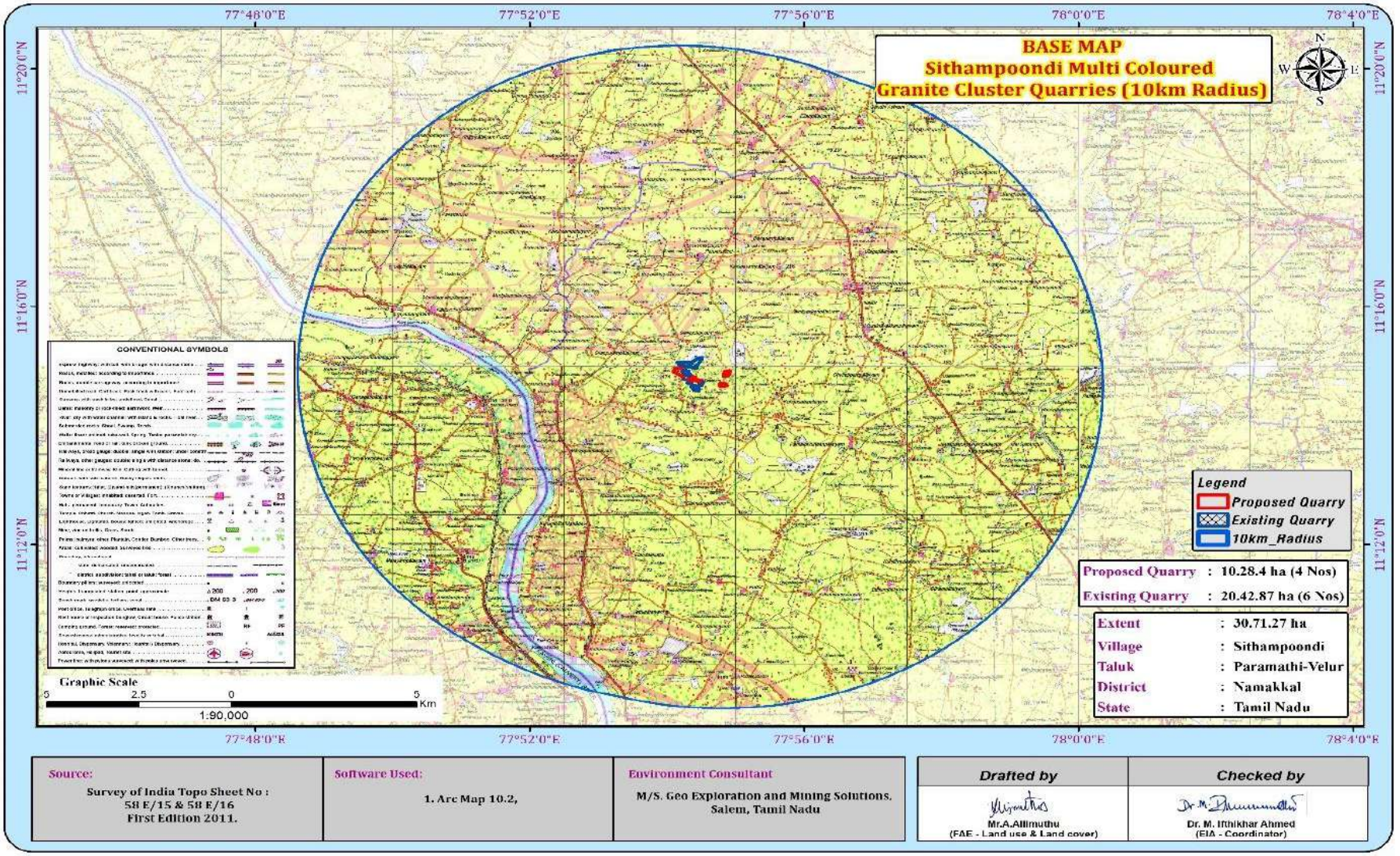
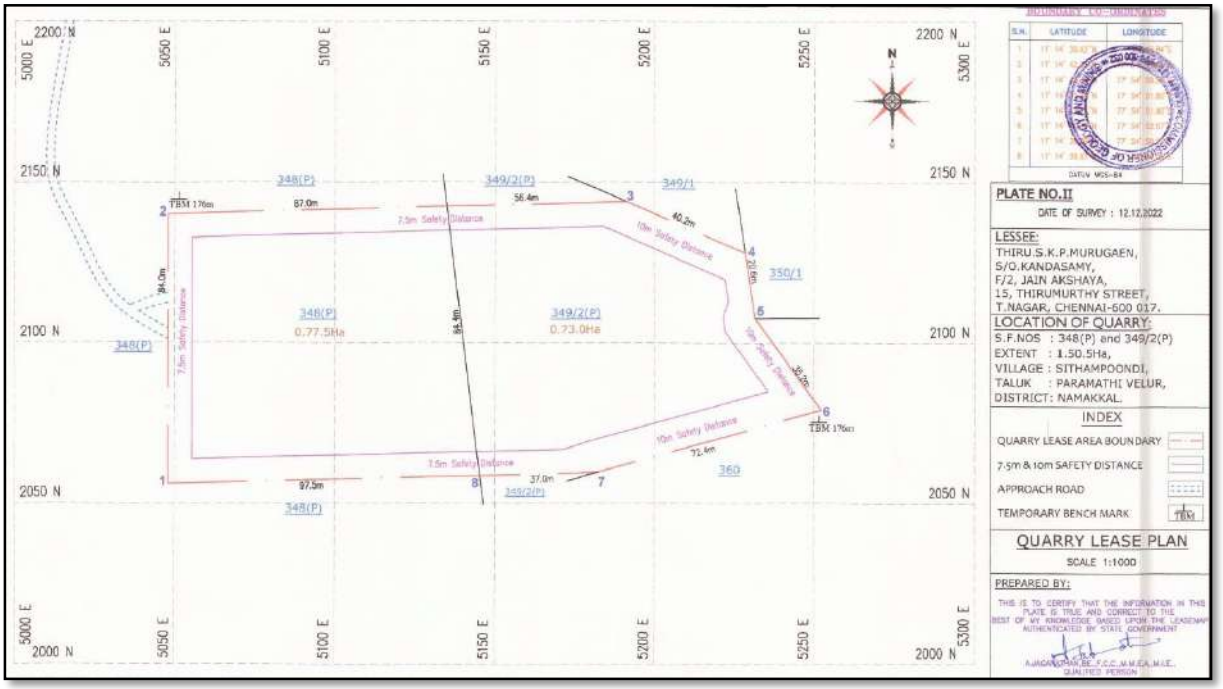
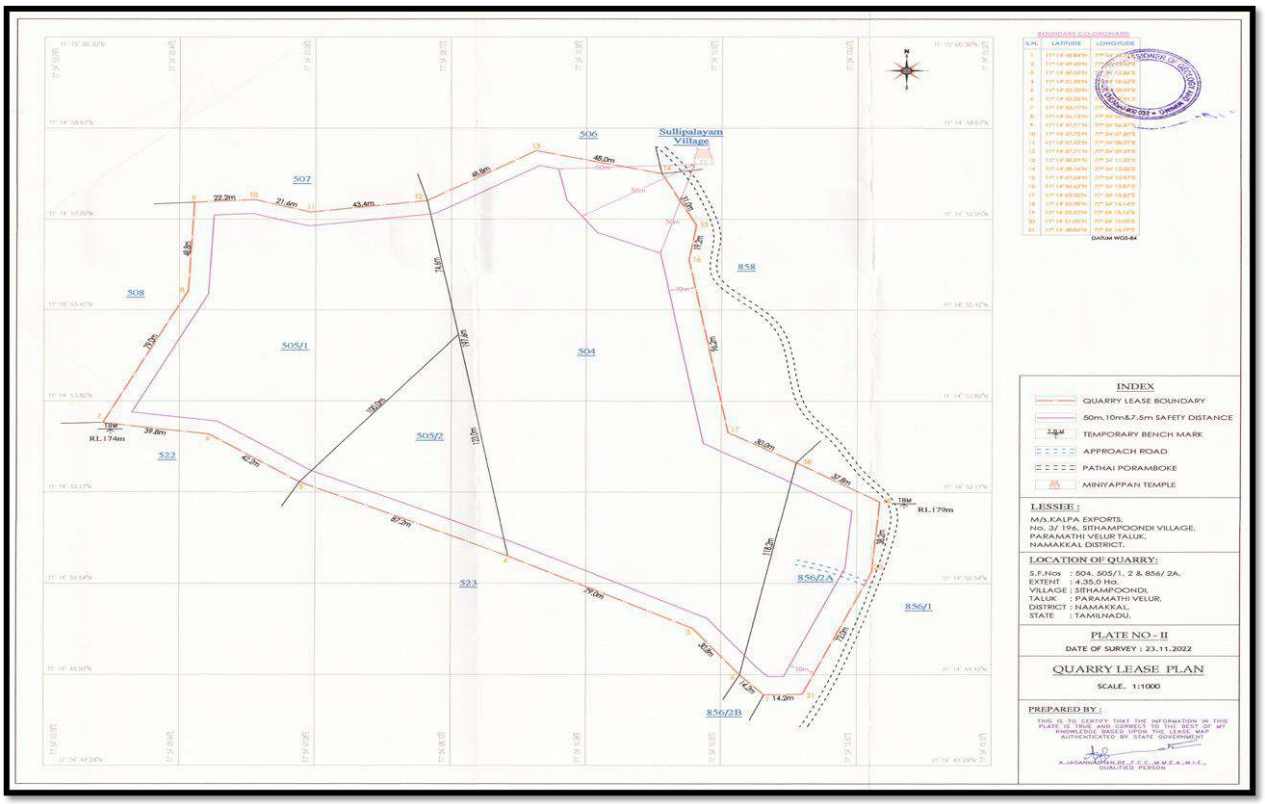


FIGURE – 4: QUARRY LEASE PLAN & SURFACE PLAN

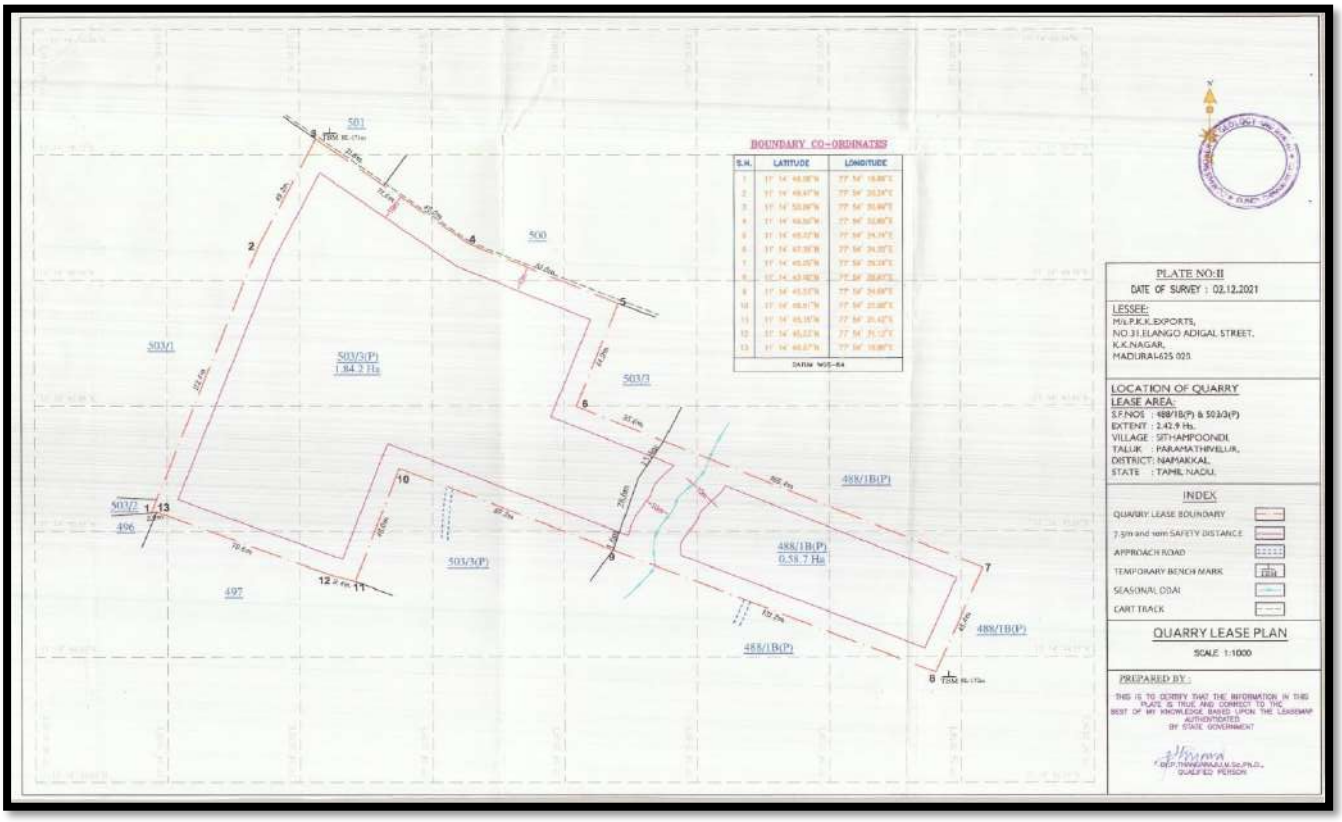
P1



P2



P3



2.4 METHOD OF MINING

Opencast Mechanized Mining Method is being proposed by formation of 5.0-meter height bench with a bench width not less than the bench height. However, as far as the quarrying of Rough Stone is concerned, observance of the provisions of Regulation 106 (2) (b) as above is seldom possible due to various inherent petro genetic factors coupled with mining difficulties. Hence it is proposed to obtain relaxation to the provisions of the above regulation from the Director of Mines Safety for which necessary provision is available with the Regulation 106 (2) (b) of MMR-1961, under Mine Act – 1952.

The top layer of Topsoil will be Excavate directly by Hydraulic Excavators and preserved all along the safety barrier to facilitate greenbelt development during Mine Closure Stage. The Rough Stone is a batholith formation and the splitting of rock mass of considerable volume from the parent rock mass will be carried out by deploying jackhammer drilling and Slurry Explosives will be used for blasting. Hydraulic Excavators attached with Rock Breakers unit will be deployed for breaking large boulders to required fragmented sizes to avoid secondary blasting and hydraulic excavators attached with bucket unit will be deployed for loading the Rough Stone into the tippers and then the stone is transported from pithead to the nearby crushers.

2.5 PROPOSED MACHINERY DEPLOYMENT

Machinery Details Proposed-P1

Drilling Equipment's					
Type	**No of Unit**	**Dia of Hole mm**	**Size capacity**	**Make**	**Motive Power**
Jack Hammer	4	32	1.2m to 6m	Atlas Copco	Compressed air
Compressor	1	-	140cfm/400psi	Atlas Copco	Diesel drive
Diamond Wire Saw	1	-	20m³/day	Optima	Diesel Generator
Diesel Generator	1	-	125kva	Powerica	Diesel
Wagon Drill	1	30-35	20hp	VKTORY	Diesel drive
Loading Equipment					
Type	**No of Unit**	**Capacity**	**Make**	**Motive Power**	
Crawler Crane	1	855	Tata P & H	Diesel Drive	
Excavator	2	300	Tata Hitachi	Diesel Drive	
Haulage within the Mine & Transport Equipment					
Type	No of Unit	Capacity	Make	Motive Power	
Tipper	2	10 tonnes	Tata	Diesel Drive	

Machinery Details Proposed-P2

Drilling Equipment's					
Type	**No of Unit**	**Dia of Hole mm**	**Size capacity**	**Make**	**Motive Power**
Jack Hammer	6	32	1.2m to 6m	Atlas Copco	Compressed air
Compressor	2	-	450/150 psi	Atlas Copco	Diesel drive
Diamond Wire Saw	2	-	20m³/day	Optima	Diesel Generator
Diesel Generator	1	-	125kva	Kirloskar	Diesel
Wagon Drill Machine	1	32	20hp	TAMROCK	Diesel drive
Loading Equipment					
Type	**No of Unit**	**Capacity**	**Make**	**Motive Power**	
Crawler Crane	1	855	Tata P & H	Diesel Drive	
Excavator	2	300	Tata Hitachi	Diesel Drive	
Haulage within the Mine & Transport Equipment					
Type	No of Unit	Capacity	Make	Motive Power	
Tippers	2	35 tonnes	Tata	Diesel Drive	

Machinery Details Proposed-P3

Drilling Equipment's					
Type	**No of Unit**	**Dia of Hole mm**	**Size capacity**	**Make**	**Motive Power**
Jack Hammer	6	32	1.2m to 6m	Atlas Copco	Compressed air
Compressor	2	-	400psi	Atlas Copco	Diesel drive
Diamond Wire Saw	2	-	30m³/day	Optima	Diesel Generator

Wagon Drill Machine	1	30-35	20hp	VKTORY	Diesel drive
Loading Equipment					
Type	**No of Unit**	**Capacity**	**Make**	**Motive Power**	
Crawler Crane	1	855	Tata P & H	Diesel Drive	
Excavator	2	300	Tata Hitachi	Diesel Drive	
Haulage within the Mine & Transport Equipment					
Type	No of Unit	Capacity	Make	Motive Power	
Tipper	2	20 tonnes	Tata	Diesel Drive	

Approved Scheme of Period

2.6 CONCEPTUAL MINING PLAN/ FINAL MINE CLOSURE PLAN

The ultimate pit size is designed based on certain practical parameters such as economical depth of mining, safety zones, permissible area, etc.,

2.7 ULTIMATE PIT DIMENSION

Ultimate Pit Dimension-P1

Length in m	Width in m	Depth in m
164	61	25

Approved Scheme of Period

Ultimate Pit Dimension-P2

Length in m	Width in m	Depth in m
289	140	43

Approved Scheme of Period

Ultimate Pit Dimension-P3

Length in m	Width in m	Depth in m
166	125	46
99	32	46

Approved Scheme of Period

3.0 DESCRIPTION OF THE ENVIRONMENT

The baseline status of the project environment is described section wise for better understanding of the broad-spectrum conditions. The baseline environment quality represents the background environmental scenario of various environmental components such as Land, Water, Air, Noise, Biological and Socio-economic status of the study area. Field monitoring studies to evaluate the base line status of the project site were carried out covering (October – December 2023) as per CPCB & MoEF & CC guidelines.

3.1 ENVIRONMENT MONITORING ATTRIBUTES

Attribute	Parameters	Frequency of Monitoring	No. of Locations	Protocol
Land-use Land cover	Land-use Pattern within 10 km radius of the study area	Data from census handbook 2011 and from the satellite imagery	Study Area	Satellite Imagery Primary Survey
*Soil	Physio - Chemical Characteristics	Once during the study period	6 (1 core & 5 buffer zone)	IS 2720 Agriculture Handbook - Indian Council of Agriculture Research, New Delhi
*Water Quality	Physical, Chemical and Bacteriological Parameters	Once during the study period	6 (2 surface water & 4 ground water)	IS 10500& CPCB Standards
Meteorology	Wind Speed Wind Direction Temperature Cloud cover Dry bulb temperature Rainfall	1 Hourly Continuous Mechanical/Automatic Weather Station	1	Site specific primary data & Secondary Data from IMD Station
*Ambient Air Quality	PM10 PM2.5 SO2 NOX Fugitive Dust	24 hourly twice a week (October – December 2023)	7 (1 core & 6 buffer)	IS 5182 Part 1-23 National Ambient Air Quality Standards, CPCB
*Noise Levels	Ambient Noise	Hourly observation for 24 Hours per location	7 (1 core & 6 buffer zone)	IS 9989 As per CPCB Guidelines
Ecology	Existing Flora and Fauna	Through field visit during the study period	Study Area	Primary Survey by Quadrate & Transect Study Secondary Data – Forest Working Plan
Socio Economic Aspects	Socio–Economic Characteristics, Population Statistics and Existing Infrastructure in the study area	Site Visit & Census Handbook, 2011	Study Area	Primary Survey, census handbook & need based assessments.

3.2 LAND ENVIRONMENT

To study the land use pattern of the core as well as a buffer zone, land use/land cover details have been identified/ maps have been prepared in accordance with the Standard ToR point no. 4 & 10 Stating:

Point No. 4 All corner coordinates of the mine lease area, superimposed on a High-Resolution Imagery/ topo sheet. topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).

Point No. 10. Lard use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary. national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted.

TABLE 3.1: LAND USE / LAND COVER TABLE 10 KM RADIUS

S.No	CLASSIFICATION	AREA_HA	AREA_%
	BUILTUP		
1	RURAL	980.05	2.77
2	URBAN	87.46	0.25
3	MINING	305.00	0.86
	AGRICULTURAL LAND		
4	CROP LAND	17437.72	49.29
5	PLANTATION	588.04	1.66
6	FALLOW LAND	13613.86	38.48
	BARREN/WASTE LANDS		
7	SCRUB LAND	1542.30	4.36
	WETLANDS/ WATER BODIES		
8	WATER BODIES/LAKE	822.02	2.32
TOTAL		35376.45	100.00

LU/LC Interpretation:

- The 10 km radius study area mainly comprises of Crop land & Agriculture Plantation land accounting of 49.29% & 1.66% of the total study area. The study area also consists of fallow land of 38.48%.
- Water Bodies such as ponds/ lakes comprises of 2.32% of the core and buffer area.
- The Scrub land accounts of 4.36%. As per the primary survey, it was observed the scrub land is mainly occupied by the stony waste and left-over domestic waste generated by the nearby areas.
- 0.86% of the total study area is occupied by the mine industries of captive mines. The area occupied by Mainly Multi Colour granite of the total buffer area. As also observed within the primary survey, the 10 km buffer area is also occupied by the medium scaled granite and marble and small Brick kiln industries also located in the study area.
- 2.77% of the area is covered under the human Settlement. The nearest village within the 3 km radius from the project site boundary is observed to be villages like Kondarasampalayam etc.

3.3 SOIL ENVIRONMENT

The samples were analysed as per the standard methods prescribed in "Soil Chemical Analysis (M.L. Jackson, 1967) & Department of Agriculture, Cooperation & Farmers Welfare, Ministry of Agriculture & Farmers Welfare, Government of India". The important properties analysed for soil are bulk density, porosity, infiltration rate, pH and Organic matter, kjeldahi Nitrogen, Phosphorous and Potassium

Interpretation & Conclusion

The physical properties of the soil samples were examined for texture, bulk density, porosity and water holding capacity. The soil texture found in the study area is Clay Loam Soil and Bulk Density of Soils in the study area varied between 1.013 – 1.505 g/cc. The Water Holding Capacity of the soil samples is found to be medium i.e. ranging from 43.8 – 51 %.

- The nature of soil is slightly alkaline to strongly alkaline with pH range 8.03 to 8.77
- The available Nitrogen content range between 288.512 to 439.040 kg/ha
- The available Phosphorus content range between 2.9 to 13.9 kg/ha
- The available Potassium range between 1.22 to 1.54 mg/kg
- Whereas, the micronutrient as zinc (Zn) and iron (Fe) were found in the range of 23.16 to 28.72 mg/kg; 2.50 to 39.65 mg/kg.

3.4 WATER ENVIRONMENT

The study area is studded with few tanks that serve as the source of drinking water and also their surplus feeds adjoining tanks. The rainfall over the area is moderate, the rainwater storage in open wells and trenches are in practice over the area and the stored water acts as source of freshwater for couple of months after rainy season.

Surface Water

Ph:

The pH varied from 7.91 to 8.01 while turbidity found within the standards (Optimal pH range for sustainable aquatic life is 6.5 to 8.5 pH).

Total Dissolved Solids:

Total Dissolved Solids varied from 614 to 721mg/l, the TDS mainly composed of carbonates, bicarbonates, Chlorides, phosphates and nitrates of calcium, magnesium, sodium and other organic matter.

Other parameters:

Chloride varied between 137.95 mg/l and 175.94mg/l while sulphates varied from 19.15 to 34.86mg/l.

Ground Water

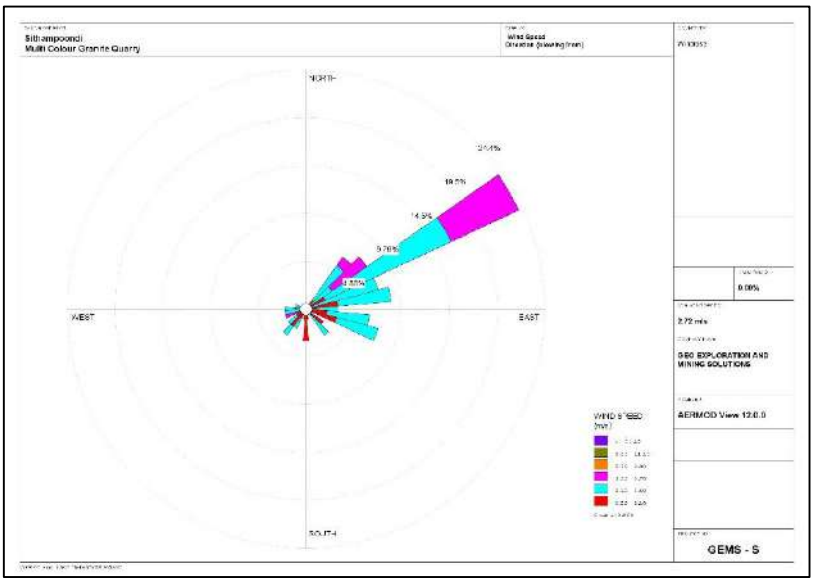
The pH of the water samples collected ranged from 6.67 to 7.99 and within the acceptable limit of 6.5 to 8.5. pH, Sulphates and Chlorides of water samples from all the sources are within the limits as per the Standard. On Turbidity, the water samples meet the requirement. The Total Dissolved Solids were found in the range of 642-745 mg/l in all samples. The Total hardness varied between 280-324mg/l. On Microbiological parameters, the water samples from all the locations meet the requirement.

The parameters thus analysed were compared with IS 10500:2012 and are well within the prescribed limits.

3.5 AIR ENVIRONMENT

The baseline studies on air environment include identification of specific air pollution parameters and their existing levels in ambient air. The ambient air quality with respect to the study zone of 10 km radius around the proposed quarry forms the baseline information.

FIGURE – 6: WIND ROSE DIAGRAM



3.6 SUMMARY OF AMBIENT AIR QUALITY

As per monitoring data, PM10 ranges from 41.3/m^3 to 47.6 µg/m^3, PM2.5 data ranges from 17.1µg/m^3 to 20.3µg/m^3, SO2 ranges from 4.1 µg/m3 to 7.2 µg/m3 and NO2 data ranges from 18.3 µg/m3 to 23.6 µg/m^3. The concentration levels of the above criteria pollutants were observed to be well within the limits of NAAQS prescribed by CPCB. The minimum & maximum concentrations of PM10 were found to be 40.7µg/m^3 in Thidumal area & 48.1 µg/m^3 in Solasiramani area respectively. The minimum & maximum concentrations of PM2.5 were found to be 15.4µg/m^3 in Thidumal Village & 20.8 µg/m^3 in Sithampoondi Village respectively. The maximum concentration in the core zone is due to the cluster of quarries situated within 500m radius.

3.7 NOISE ENVIRONMENT

Ambient noise levels were measured at 7 (Seven) locations around the proposed project area. Noise levels recorded in core zone during day time were from 4.27 (A) Leq and during night time were from 38.5 dB (A) Leq. Noise levels recorded in buffer zone during day time were from 41.1–45.5 dB (A) Leq and during night time were from 35.6 – 39.2 dB (A) Leq.

The values of noise observed in some of the areas are primarily owing to quarrying activities due to cluster of quarries within 500m radius, movement of vehicles and other anthropogenic

activities. Noise monitoring results reveal that the maximum & minimum noise levels at day time were recorded in the range of 45.5 dB(A) Leq in Bamagoundanpalayam area and 41.1 dB(A) Leq in minimum Solasiramani area and 35.6 dB(A) in Solasiramani Village & 39.2 dB(A) in Uppupalaiyam Village at night time. Thus, the noise level for Industrial and Residential area meets the requirements of CPCB.

3.8 ECOLOGICAL ENVIRONMENT

The study involved in the collection of primary data by conducting a survey in the field, examination of floral and faunal records in previously published reports and records. Analysis of the information is the view of the possible alteration in the environment of the project site. For the survey of fauna, both direct and indirect observation methods were used.

There is no schedule I species of animals observed within study area as per Wildlife Protection Act 1972 as well as no species is in vulnerable, endangered or threatened category as per IUCN. There is no endangered red list species found in the study area. Hence this small operation over short period of time will not have any significant impact on the surrounding flora and fauna.

3.9 SOCIO ECONOMIC ENVIRONMENT

It includes demographic structure of the area, provision of basic amenities viz., housing, education, health and medical services, occupation, water supply, sanitation, communication, transportation, prevailing diseases pattern as well as feature like temples, historical monuments etc., at the baseline level. This will help in visualizing and predicting the possible impact depending upon the nature and magnitude of the project.

The socio-economic study of surveyed villages gives a clear picture of its population, average household size, literacy rate and sex ratio etc. It is also found that a part of population is suffering from lack of permanent job to run their day-to-day life. Their expectation is to earn some income for their sustainability on a long-term basis.

The proposed project will aim to provide preferential 113 persons to the local people there by improving the indirect employment opportunity for 150 persons and in turn the social standards will improve.

4. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

In order to maintain the environmental commensuration with the mining operation, it is essential to undertake studies on the existing environmental scenario and assess the impact on different environmental components. This would help in formulating suitable management plans sustainable resource extraction.

4.1 LAND ENVIRONMENT:

ANTICIPATED IMPACT

- Permanent or temporary change on land use and land cover.
- Change in Topography: Topography of the ML area will change at the end of the life of the mine.

- Movement of heavy vehicles sometimes cause problems to agricultural land, human habitations due to dust, noise and it also causes traffic hazards.
- Due to degradation of land by pitting the aesthetic environment of the core zone may be affected.
- Earthworks during the rainy season increase the potential for soil erosion and sediment laden water entering the water ways.
- If no due care is taken wash off from the exposed working area may choke the water course & can also causes the siltation of water course.

MITIGATION MEASURES

- The mining activity will be gradual confined in blocks and excavation will be undertaken progressively along with other mitigative measures like phase wise development of greenbelt etc.,
- Construction of garland drains all around the quarry pits and construction of check dam at strategic location in lower elevations to prevent erosion due to surface runoff during rainfall and also to collect the storm water for various uses within the proposed area.
- Green belt development along the boundary within safety zone. The small quantity of water stored in the mined-out pit will be used for greenbelt.
- Thick plantation will be carried out on unutilized area, top benches of mined out pits, on safety barrier, etc.,
- At conceptual stage, the land use pattern of the quarry will be changed into Greenbelt area and temporary reservoir.
- In terms of aesthetics, natural vegetation surrounding the quarry will be retained (such as in a buffer area i.e., 7.5m safety barrier and other safety provided) so as to help minimise dust emissions.
- Proper fencing will be carried out at the conceptual stage, Security will be posted round the clock, to prevent inherent entry of the public and cattle.

4.2 SOIL ENVIRONMENT

IMPACT ON SOIL ENVIRONMENT

Erosion and Sedimentation (Removal of protective vegetation cover; Exposure of underlying soil horizons that may be less pervious, or more erodible than the surface layers; Reduced capacity of soils to absorb rainfall; Increased energy in storm-water runoff due to concentration and velocity; and Exposure of subsurface materials which are unsuitable for vegetation establishment).

MITIGATION MEASURES FOR SOIL CONSERVATION

- Run-off diversion – Garland drains will be constructed all around the project boundary to prevent surface flows from entering the quarry works areas. And will be discharged into vegetated natural drainage lines, or as distributed flow across an area stabilised against erosion.
- Sedimentation ponds - Run-off from working areas will be routed towards sedimentation ponds. These trap sediment and reduce suspended sediment loads before runoff is discharged from the

quarry site. Sedimentation ponds should be designed based on runoff, retention times, and soil characteristics. There may be a need to provide a series of sedimentation ponds to achieve the desired outcome.

- Retain vegetation – Retain existing or re-plant the vegetation at the site wherever possible.
- Monitoring and maintenance – Weekly monitoring and daily maintenance of erosion control systems so that they perform as specified specially during rainy season.

4.3 WATER ENVIRONMENT

ANTICIPATED IMPACT

- The major sources of water pollution normally associated due to mining and allied operations are:
    - Generation of waste water from vehicle washing.
    - Washouts from surface exposure or working areas
    - Domestic sewage
    - Disturbance to drainage course in the project area
    - Mine Pit water discharge
- Increase in sediment load during monsoon in downstream of lease area
- This being a mining project, there will be no process effluent. Waste from washing of machinery may result in discharge of Oil & grease, suspended solids.
- The sewage from soak pit may percolate to the ground water table and contaminate it.
- Surface drainage may be affected due to Mining
- Abstraction of water may lead to depletion of water table

MITIGATION MEASURES

- Garland drain, settling tank will be constructed along the project area. The Garland drain will be connected to settling tank and sediments will be trapped in the settling traps and only clear water will be discharged out to the natural drainage
- Rainwater will be collected in sump in the mining pits and will be allowed to store and pumped out to surface settling tank of 15 m x 10m x 3m to remove suspended solids if any. This collected water will be judiciously used for dust suppression and such sites where dust likely to be generated and for developing green belt. The proponent will collect and judicially utilize the rainwater as part of rainwater harvesting system.
- Providing benches with inner slopes and through a system of drains and channels, allowing rain water to descent into surrounding drains, so as to minimize the effects of erosion & water logging arising out of uncontrolled descent of water
- Reuse the water collected during storm for dust suppression and greenbelt development within the mines

- Installing interceptor traps/oil separators to remove oils and greases. Water from the tipper wash-down facility and machinery maintenance yard will pass through interceptor traps/oil separators prior to its reuse;
- Using flocculating or coagulating agents to assist in the settling of suspended solids during monsoon seasons;
- Periodic (every 6 month once) analysis of quarry pit water and ground water quality in nearby villages
- Domestic sewage from site office & urinals/latrines provided in ML is discharged in septic tank followed by soak pits
- Waste water discharge from mine will be treated in settling tanks before using for dust suppression and tree plantation purposes
- De-silting will be carried out before and immediately after the monsoon season
- Regular monitoring (every 6 month once) and analysing the quality of water in open well, bore wells and surface water

4.4 AIR ENVIRONMENT

ANTICIPATED IMPACT

- During mining, at various stages activities such as excavation, drilling, blasting, and transportation of materials, particular matter (PM), gases such as Sulphur dioxide, oxides of Nitrogen from vehicular exhaust are the main air pollutants.
- Emissions of noxious gases due to incomplete detonation of explosive may sometimes pollute the air.
- The fugitive dust released from the mining operations may cause effect on the mine workers who are directly exposed to the fugitive dust.
- Simultaneously, the air-borne dust may travel to longer distances and settle in the villages located near the mine lease area.

MITIGATION MEASURES

Drilling – To control dust at source, wet drilling will be practiced. Where there is a scarcity of water, suitably designed dust extractor will be provided for dry drilling along with dust hood at the mouth of the drill-hole collar.

Advantages of Wet Drilling:-

- In this system dust gets suppressed close to its formation. Dust suppression become very effective and the work environment will be improved from the point of occupational comfort and health.
- Due to dust free atmosphere, the life of engine, compressor etc., will be increased.
- The life of drill bit will be increased.
- The rate of penetration of drill will be increased.

- Due to the dust free atmosphere visibility will be improved resulting in safer working conditions.

Blasting

- Establish time of blasting to suit the local conditions and water sprinkling on blasting face
- Avoid blasting i.e., when temperature inversion is likely to occur and strong wind blows towards residential areas
- Controlled blasting includes Adoption of suitable explosive charge and short delay detonators, adequate stemming of holes at collar zone and restricting blasting to a particular time of the day i.e., at the time lunch hours, controlled charge per hole as well as charge per round of hole
- Before loading of material water will be sprayed on blasted material
- Dust mask will be provided to the workers and their use will be strictly monitored

Haul Road & Transportation

- Water will be sprinkled on haul roads twice a day to avoid dust generation during transportation.
- Transportation of material will be carried out during day time and material will be covered with taurpaulin.
- The speed of tippers plying on the haul road will be limited below 20 km/hr to avoid generation of dust.
- Water sprinkling on haul roads & loading points will be carried out twice a day.
- Main source of gaseous pollution will be from vehicle used for transportation of mineral; therefore, weekly maintenance of machines improves combustion process & makes reduction in the pollution.
- The un-metalled haul roads will be compacted weekly before being put into use.
- Over loading of tippers will be avoided to prevent spillage.
- It will be ensured that all transportation vehicles carry a valid PUC certificate.
- Grading of haul roads and service roads to clear accumulation of loose materials.

Green Belt

- Planting of trees all along main mine haul roads and regular grading of haul roads will be practiced to prevent the generation of dust due to movement of dumpers/trucks.
- Green belt of adequate width will be developed around the project areas.

Occupational Health

- Dust mask will be provided to the workers and their use will be strictly monitored
- Annual medical check-ups, trainings and campaigns will be arranged to ensure awareness about importance of wearing dust masks among all mine workers & tipper drivers
- Ambient Air Quality Monitoring will be conducted six months once to assess effectiveness of mitigation measures proposed.

4.5 NOISE ENVIRONMENT

ANTICIPATED IMPACT

Noise pollution poses a major health risk to the mine workers. Following are the sources of noise in the existing open cast mine project are being observed such as Drilling, & Blasting, Loading and during movement of vehicles.

MITIGATION MEASURES

- Usage of sharp drill bits while drilling which will help in reducing noise;
- Secondary blasting will be totally avoided and hydraulic rock breaker will be used for breaking boulders;
- Controlled blasting with proper spacing, burden, stemming and optimum charge/delay will be maintained;
- The blasting will be carried out during favourable atmospheric condition and less human activity timings by using nonelectrical initiation system;
- Proper maintenance, oiling and greasing of machines will be done every week to reduce generation of noise;
- Provision of sound insulated chambers for the workers working on machines (HEMM) producing higher levels of noise;
- Silencers / mufflers will be installed in all machineries;
- Green Belt/Plantation will be developed around the project area and along the haul roads. The plantation minimizes propagation of noise;
- Personal Protective Equipment (PPE) like ear muffs/ear plugs will be provided to the operators of HEMM and persons working near HEMM and their use will be ensured though training and awareness.
- Regular medical check–up and proper training to personnel to create awareness about adverse noise level effects.

4.6 BIOLOGICAL ENVIRONMENT

ANTICIPATED IMPACT

The developmental programs, policies, and projects operated or managed by government or private bodies can cause potentially significant changes in the physical, biological, and socio-economic environment. In some cases, the changes may be beneficial while in others it may be detrimental to the environment. Accordingly, environmental impact studies are required for systematic identification, qualification, and interpretation of the anticipated changes. The main environmental problems associated with mining activities are deforestation, land degradation (change in topography, soil erosion), visual intrusion, disturbance to the hydrological system, and water, air, and noise pollution which ultimately impact upon the floral and faunal status of the project area.

MITIGATION MEASURES

Greenbelt means the planting of special types of plants suitable to that particular agroclimatic zone and soil characteristics in a place that will make the area cooler, reduce air pollution, prevent soil erosion, and further improve the soil fertility status. A green belt around the periphery of the boundary and roadside will be created to avoid erosion of soil, prevention of landslides, and minimize air pollution and noise pollution in the project area. Green plants are capable of absorbing air pollutants and forming sinks for pollutants. Leaves with their vast area in a tree crown, absorb pollutants on their surface, effectively reducing their concentration and noise level in the ambient.

The objectives of the green belt cover will cover the following:

- Noise abatement
- Ecological restoration
- Aesthetic, biological and visual improvement of area due to improved vegetative and plantations cover.

GREENBELT DEVELOPMENT PLAN -P1-P3

P1

Year	***No.of trees proposed to be planted***	***Survival %***	***Area to be covered sq.m***	***Name of the species***
I	750	80%	Along 7.5m safety distance, panchayat road.	Neem, Pongamia Pinnata, Mango etc., etc.,

P2

Year	***No.of trees proposed to be planted***	***Survival %***	***Area to be covered sq.m***	***Name of the species***
I	2,200	80%	Along 7.5m safety distance, panchayat road.	Neem, Pongamia Pinnata, Mango etc., etc.,

P3

Year	***No.of trees proposed to be planted***	***Survival %***	***Area to be covered sq.m***	***Name of the species***
I	1,220	80%	Along 7.5m safety distance, panchayat road.	Neem, Pongamia Pinnata, Mango etc., etc.,

4.7 SOCIO ECONOMIC ENVIRONMENT

The socio-economic impacts of mining are many. Impacts of a mine project may be positive or Negative. The adverse impacts attribute to physical displacement due to land acquisition, which is followed by loss of livelihood, mental agony, changes in social structure, and risk to food security etc., People are also directly affected due to pollution. Social Impact Assessment (SIA) is a process of analysis, monitoring and managing the social consequences of a project. Study on Socio-economic status has already been carried out using primary socio-economic survey for generating the baseline data of Socio-economic status.

Anticipated Impact

Employment generation (Direct and Indirect) due to the project has generated direct and indirect employment for more than 30-40 persons. Preference will be given to the local population for employment in all categories including semi-skilled and unskilled. The villages and their inhabitants in the buffer zone will not be disturbed from their settlements due to the mining operations.

It is obvious to assume that the activities of the mining operations will improve the socio-economic levels in the study area. The anticipated impact of this project on various aspects is described in the following sections:

Impact on human settlement: Overall, due to employment generation and economic progress, there will be positive changes in the socio-economic condition of the people residing in the vicinity of the project site. The local population will have preference to get an employment. No resettlement occurred due to mining activity. Built up land has been increased marginally.

Impact on Population Growth: Thousand populations will grow annually and demand of primary needs and employment will increase due to population growth. It will provide some direct and indirect employment to the people in and around the villages.

Impact on Vegetation: No decline in agricultural land. It has been increased over a period of time by utilizing the water stored in the working pits. No deforestation will be happened.

Therefore, due to mining, per capita income of local people will be improved. The local people have been provided with either direct employments or indirect employment such as business, contract works and development work like roads, etc. and other welfare amenities such as Sanitary facilities, Solar Lighting to Govt school, Health Care to the villages in buffer zone, Maintenance of village road or Providing funds to local body or Prime minister's fund on Socio economic Development and relief measures.

4.6.2 Mitigation Measures

- Good maintenance practices will be adopted for plant machinery and equipment, which will help to avert potential noise problems.
- Green belt will be developed in and around the project site as per Central Pollution Control Board (CPCB) guidelines.
- Drilling, blasting etc at specified location will be followed with proper schedule.

- Appropriate air pollution control measure will be taken so as to minimize the environmental impact within the core zone.

Impact and Mitigation Measures: The proposed project could result due to migrant workers, worker camps, induced development etc. Due to the migrant workers there would impact on the existing infrastructure facilities in the surrounding villages. The impact of the proposed project on socio economic conditions of the study area is as follows.

TABLE 4.13: SOCIO ECONOMIC IMPACT AND MITIGATION MEASURES

Impacts		Mitigation measures
Positive	**Negative**	
It would generate employment opportunities to the local people and reduce the migrants to outside ➢ Increase of floating population. ➢ Increase in demand of services includes hotels, lodges, public transport (including taxis), etc. ➢ Economic up liftment of the area. ➢ Rapid growth of service sector will result in increase of incomes in the area. ➢ Expanding of services like retail shops, banks, automobile workshops, school, health care, etc. ➢ The project would also trigger many direct and indirect benefits for economic advancement and social development of project area.	➢ Due to the process of Land Acquisition there are many Private land holders losing land in this site. ➢ There will be structural changes in occupation and alternative works will be performed ➢ Expecting release of surreptitiously air Pollution during the operation period. ➢ Loss of cultivable lands. ➢ Increase in the cost of man power in the agriculture sector due to Industrial/Mining services wage rates. This has affected cultivation.	➢To prevent the air, water and noise pollution for this implements the adequate scientific measures (treat) as per the pollution control regulatory standards. ➢Employment facilities to the local people on the priority bases to the impacted families who lost their land due to the proposed Project. ➢Periodical monitoring of the families in surrounding villages. Regular medical check-up and developing infrastructure. ➢Initiating Skill development programs for better opportunities for the educated youth.

5. ANALYSIS OF ALTERNATIVES (TECHNOLOGY AND SITE)

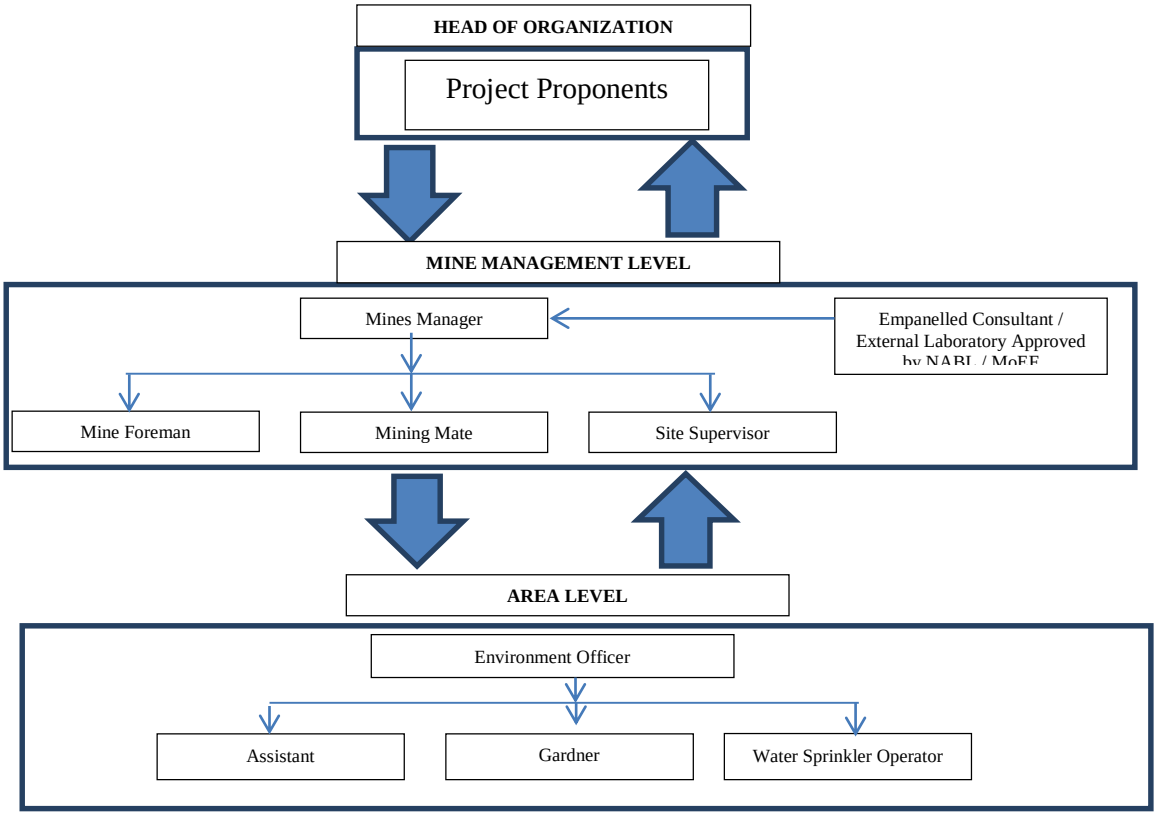
No alternatives are suggested as all the mine sites are mineral specific.

6. ENVIRONMENT MONITORING PROGRAM

An Environment monitoring cell (EMC) will be constituted to monitor the implementation of EMP and other environmental protection measures in all the proposed quarries. The responsibilities of this cell will be:

- Implementation of pollution control measures
- Monitoring programme implementation
- Post-plantation care
- To check the efficiency of pollution control measures taken
- Any other activity as may be related to environment
- Seeking expert's advice when needed.

6.1 ENVIRONMENTAL MONITORING CELL



6.2 POST ENVIRONMENTAL CLEARANCE MONITORING SCHEDULE

S. No.	Environment Attributes	Location	Monitoring		Parameters
			Duration	Frequency	
1	Air Quality	2 Locations (1 Core & 1 Buffer)	24 hours	Once in 6 months	Fugitive Dust, PM2.5, PM10, SO2 and NOx.
2	Meteorology	At mine site before start of Air Quality Monitoring & IMD Secondary Data	Hourly / Daily	Continuous online monitoring	Wind speed, Wind direction, Temperature, Relative humidity and Rainfall
3	Water Quality Monitoring	2 Locations (1SW & 1 GW)	-	Once in 6 months	Parameters specified under IS:10500, 1993 & CPCB Norms
4	Hydrology	Water level in open wells in buffer zone around 1 km at specific wells	-	Once in 6 months	Depth in bgl
5	Noise	2 Locations (1 Core & 1 Buffer)	Hourly – 1 Day	Once in 6 months	Leq, Lmax, Lmin, Leq Day & Leq Night

6	Vibration	At the nearest habitation (in case of reporting)	–	During blasting Operation	Peak Particle Velocity
7	Soil	2 Locations (1 Core & 1 Buffer)	–	Once in six months	Physical and Chemical Characteristics
8	Greenbelt	Within the Project Area	Daily	Monthly	Maintenance

7. ADDITIONAL STUDIES

7.1 RISK ASSESSMENT

The methodology for the risk assessment has been based on the specific risk assessment guidance issued by the Directorate General of Mine Safety (DGMS), Dhanbad, vide Circular No.13 of 2002, dated 31st December, 2002. The DGMS risk assessment process is intended to identify existing and probable hazards in the work environment and all operations and assess the risk levels of those hazards in order to prioritize those that need immediate attention. Further, mechanisms responsible for these hazards are identified and their control measures, set to timetable are recorded along with pinpointed responsibilities.

The whole quarry operation will be carried out under the direction of a Qualified Competent Mine Manager holding certificate of competency to manage a metalliferous mine granted by the DGMS, Dhanbad for proposed project. Risk Assessment is all about prevention of accidents and to take necessary steps to prevent it from happening.

7.2 DISASTER MANAGEMENT PLAN

Natural disasters like Earthquake, Landslides have not been recorded in the past history as the terrain is categorized under seismic zone III. The area is far away from the sea hence the disaster due to heavy floods and tsunamis are not anticipated.

The Disaster Management Plan is aimed to ensure safety of life, protection of environment, protection of installation, restoration of production and salvage operations in this same order of priorities.

The objective of the Disaster Management Plan is to make use of the combined resources of the mine and the outside services to achieve the following:

- Rescue and medical treatment of casualties;
- Safeguard other people;
- Minimize damage to property and the environment;
- Initially contain and ultimately bring the incident under control;
- Secure the safe rehabilitation of affected area; and
- Preserve relevant records and equipment for the subsequent inquiry into the cause and circumstances of the emergency.

7.3 CUMULATIVE IMPACT STUDY

CUMULATIVE PRODUCTION LOAD OF GRANITE

Quarry	Mineable Reserves ROM in m^3	Mineable Reserves of Granite in m^3	Proposed production of ROM for five-year period in m^3	Production of ROM Per Day in m^3	Production of Granite Per day in m^3	Number of Lorry loads of Granite per day
P1	91,875	55,125	17,437	12	7	1
P2	6,44,474	3,86,684	69,955	47	28	4
P3	2,12,492	1,27,495	50,125	33	20	3
E1	5,59,360	3,35,616	83,330	56	34	5
E2	2,99,330	1,79,598	12,750	9	6	1
E3	79,300	47,580	16,800	12	7	1
E4	1,01,950	61,170	30,360	21	13	1
E5	2,21,535	1,44,000	55,170	37	96	3
Total	**22,10,316**	**13,37,268**	**3,35,927**	**227**	**211**	**19**

Source: Approved Mining plan of Respective mines

PREDICTED NOISE INCREMENTAL VALUES FROM CLUSTER

Location ID	Background Value (Day) dB(A)	Incremental Value dB(A)	Total Predicted dB(A)	Residential Area Standards dB(A)
Habitation Near P1	53.4	42.4	53.7	55
Habitation Near P2	45.2	43.2	47.3	
Habitation Near P3	42.1	44.1	49.2	
Habitation Near E1	52.1	47.4	51.8	
Habitation Near E2	43.4	39.8	45.0	
Habitation Near E3	42.9	40.1	44.7	
Habitation Near E4	49.4	44.8	50.7	
Habitation Near E5	42.1	44.2	47.0	

SOCIO ECONOMIC BENEFITS

Location code	Employment	Project Cost	CER
P1	33	Rs.3,39,34,000/-	Rs.5,00,000/-
P2	40	Rs.3,60,28,000/-	Rs.5,00,000/-
P3	40	Rs.3,57,8,000/-	Rs.5,00,000/-
E1	42	Rs. 3,77,58,000/-	Rs.5,00,000/-
E2	35	Rs.2,96,25,000/-	Rs.5,00,000/-
E3	40	Rs. 61,05,000/-	Rs.5,00,000/-
E4	33	Rs. 2,44,81,500/-	Rs.5,00,000/-
E5	40	Rs. 3,02,80,812/-	Rs.5,00,000/-
Total	**303**	**Rs. 20,17,90,312/-**	**Rs.40,00,000**

A total of 303 people will get employment due to 8 mines in cluster and already employed. Allocation for Corporate Environment Responsibility (CER) shall be made as per Government of India, MoEF & CC Office Memorandum F.No.22-65/2017-IA.III, Dated: 01.05.2018 by all the mines.

8. PROJECT BENEFITS

This Proposed Project for Quarrying Multi Colour Granite Quarry at Sithampoondi village aims to produce cumulatively ROM 1,37,517m^3 for the entire period Life of the mine for Life of Mine of 20 Years. This will enhance the socio-economic activities in the adjoining areas and will result in the following benefits

- Increase in Employment Potential
- Improvement in Socio-Economic Welfare
- Improvement in Physical Infrastructure
- Improvement in Social infrastructure

9. ENVIRONMENT MANAGEMENT PLAN

The Environment Monitoring cell discussed formed by the mine management will ensure effective implementation of environment management plan and to ensure compliance of environmental statutory guidelines through Mine Management Level.

The said team will be responsible for:

- Monitoring of the water/ waste water quality, air quality and solid waste generated
- Analysis of the water and air samples collected through external laboratory
- Implementation and monitoring of the pollution control and protective measures/ devices which shall include financial estimation, ordering, installation of air pollution control equipment, waste water treatment plant, etc.
- Co-ordination of the environment related activities within the project as well as with outside agencies.
- Collection of health statistics of the workers and population of the surrounding villages.
- Green belt development.
- Monitoring the progress of implementation of the environmental monitoring programme.
- Compliance to statutory provisions, norms of State Pollution Control Board, Ministry of Environment and Forests and the conditions of the environmental clearance as well as the consents to establish and consents to operate.

10. CONCLUSION

Various aspects of mining activities were considered and related impacts were evaluated. Considering all the possible ways to mitigate the environmental concerns Environmental Management Plan was prepared and fund has been allocated for the same. The EMP is dynamic, flexible and subjected to periodic review. For project where the major environmental impacts are associated, EMP will be under regular review. Senior Management responsible for the project will conduct a review of EMP and its implementation to ensure that the EMP remains effective and appropriate. Thus, the proper steps will be taken to accomplish all the goals mentioned in the EMP and the project will bring the positive impact in the study area.

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